

What is claimed is:

1. A method for forming a copper thin film in which a raw material gas is introduced into a substrate processing chamber storing a substrate and being under a reduced pressure to form a copper thin film on the substrate, comprising the steps of:

introducing an addition gas in addition to a raw material gas at the initial stage of deposition; and

thereafter stopping introducing the addition gas and continuing introducing the raw material gas.

2. A method for forming a copper thin film in which a raw material gas is introduced into a substrate processing chamber storing a substrate and being under a reduced pressure to form a copper thin film on the substrate, comprising the steps of:

introducing an addition gas in addition to a raw material gas at the initial stage of deposition;

thereafter stopping introducing the addition gas and continuing introducing the raw material gas; and

introducing the addition gas at predetermined intervals of time.

3. A method for forming a copper thin film according to claim 1, wherein the addition gas is introduced into the substrate processing chamber and thereafter the raw material gas is introduced into the substrate processing chamber to start depositing.

4. A method for forming a copper thin film according to claim 2, wherein the addition gas is introduced into the substrate processing chamber and thereafter the raw material gas is introduced into the substrate processing chamber to start depositing.

5. A method for forming a copper thin film according to claim 1, wherein

the addition gas is any one of steam made by evaporating water, a gas made by evaporating an alcohol derivative, a gas made by evaporating a carboxylic acid derivative, and a gas made by evaporating a  $\beta$ -diketone derivative.

6. A method for forming a copper thin film according to claim 1, wherein the addition gas is any one of steam made by evaporating water from which dissolved oxygen is removed, a gas made by evaporating an alcohol derivative from which dissolved oxygen is removed, a gas made by evaporating a carboxylic acid derivative from which dissolved oxygen is removed, and a gas made by evaporating a  $\beta$ -diketone derivative from which dissolved oxygen is removed.

7. A method for forming a copper thin film according to claim 1, wherein the introduction of the addition gas introduced into the substrate processing chamber is that steam made by evaporating water filled into a gas cylinder connected to the substrate processing chamber is introduced in the substrate processing chamber from the gas cylinder.

8. A method for forming a copper thin film according to claim 1, wherein the raw material gas is a gas made by evaporating copper hexafluoroacetylacetone(trimethylvinylsilyl)(I).

9. A system for forming a copper thin film, comprising: a substrate processing chamber the inside of which can be held under a reduced pressure; a substrate supporting mechanism for supporting a substrate in the substrate processing chamber; a substrate temperature control mechanism for keeping the substrate at a predetermined temperature; and a raw material gas introducing mechanism for evaporating a liquid raw material or a solid raw material into a raw material gas and for supplying the raw material gas to the substrate processing chamber, wherein an addition gas introducing mechanism comprised of a mechanism for removing

dissolved oxygen in a liquid addition material and a mechanism for evaporating the liquid addition material, from which the dissolved oxygen is removed, is connected to the substrate processing chamber via a flow control mechanism.

10. A system for forming a copper thin film, comprising: a substrate processing chamber the inside of which can be held under a reduced pressure; a substrate supporting mechanism for supporting a substrate in the substrate processing chamber; a substrate temperature control mechanism for keeping the substrate at a predetermined temperature; and a raw material gas introducing mechanism for evaporating a liquid raw material or a solid raw material into a raw material gas and for supplying the raw material gas to the substrate processing chamber, wherein a gas cylinder filled with steam made by evaporating water is connected to the substrate processing chamber via a flow control mechanism.